

REMARKS

In the aforementioned claim amendments, claims 9, 16 and 20 have been canceled and claims 21-44 added. Now pending in the application are claims 1-8, 10-15, 17-19 and 21-44, of which claims 1 and 13 are independent. The following comments address all stated grounds for rejection and place the presently pending claims, as identified above, in condition for allowance.

Supplemental IDS

Applicants submit for the Examiner's consideration publications and information cited in an International Search Report mailed April 4, 2003 during the prosecution of PCT/GB02/05639, which corresponds to the pending application.

Claim Amendments

Claims have been amended to clarify the scope of the claimed invention. In particular, claims 1 and 13 have been amended to recite *a semiconductor portion disposed adjacent to the optical waveguide to support the transmission line*. This limitation is incorporated from claim 9, now canceled in the aforementioned claim amendments. Support for the claim amendments could be found in Fig. 3 and corresponding description at page 9, line 12-15 of the Specification. No new matter has been introduced. Applicants request that the amendments be entered, and the claims passed to allowance.

Claim Objections

Claim 1 is objected to because of informalities. In response to the objection, Applicants amend claim 1 to remove the recitation of "stack" from claim 1.

Claim 9 is also objected to because of informalities. In particular, the Examiner indicates that there is no disclosure of semiconductor support structure. In the aforementioned claim amendments, the limitation of claim 9 is incorporated into claim 1 and claim 9 is canceled. Applicants understand that the objection of claim 9 is now directed to claim 1. In response to the objection, Applicants submit that a bridge is disclosed in Figs. 3 and 4 (40 in Fig. 3 and 66 in Fig. 4) and corresponding description at page 9 lines 12-15 and page 10 lines 2-3. It is also disclosed that the bridge functions as mechanical support structure.

In light of the aforementioned claim amendments and arguments, Applicants submit that claim 1 is in condition for allowance.

Claim Rejection under 35 U.S.C. §112

Claim 10 is rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

In response to the rejection, Applicants submit that a doped conduction layer (14) is disclosed in Fig.1 and corresponding description at page 7, lines 16-26. In particular, the conduction layer (14) is also described as defining a common d.c. electrode. In light of the aforementioned arguments, Applicants request that the Examiner reconsider and withdraw the present rejection.

Claim Rejections under 35 U.S.C. §102(b)

Claims 1, 6-8, 13, 17-19 and 20 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,545,791 to McCaughan *et al.* ("McCaughan"). Claim 20 is canceled in the aforementioned claim amendments. Applicants respectfully traverse this rejection in light of the above amendments and the following remarks.

Amended claim 1 recites an integrated circuit that comprises a semiconductor substrate, an optical waveguide formed over the substrate, and an insulating planarization layer formed adjacent to the optical waveguide. The integrated circuit also includes a microwave transmission line formed over the planarization layer and overlying a top surface of the optical waveguide. The integrated circuit further comprises *a semiconductor portion disposed adjacent to the optical waveguide to support the transmission line*. Amended claim 13 is directed to a method for fabricating an integrate circuit and recites similar limitations to amended claim 1.

McCaughan discloses electro-optic optical elements.

Applicants respectfully submit that McCaughan fails to disclose each and every element of the claimed invention. Specifically, McCaughan fails to disclose *a semiconductor portion disposed adjacent to the optical waveguide to support the transmission line*, as recited in amended claims 1 and 13. McCaughan discloses in Fig. 4 a modulator having a Mach-Zehnder structure. McCaughan, however, does not disclose any semiconductor portion disposed adjacent to the optical waveguide to support the transmission line.

In light of the amendments and arguments set forth above, McCaughan fails to disclose each and every element of the claimed invention. Hence, McCaughan does not anticipate amended claims 1 and 13. Applicants therefore request the Examiner to reconsider and withdraw the rejection of amended claims 1, 6-8, 13 and 17-19 under 35 U.S.C. §102(e), and pass the pending claims to allowance.

Claim Rejection under 35 U.S.C. §103(a)

Rejections of Claims 2, 9, 11 and 14

Claims 2, 9, 11 and 14 are rejected under 35 U.S.C. §103(a) as being unpatentable over McCaughan in view of Applicants' Disclosure of Prior Art ("ADPA"). In the aforementioned

claim amendments, claim 9 is canceled. Applicants respectfully traverse this rejection in light of the above amendments and the following remarks.

The Examiner indicates that ADPA discloses tetra-ethyl-ortho-silicate (TEOS) as an insulating material.

Applicants respectfully submit that McCaughan and ADPA fail to teach or suggest all of the claim limitations of amended claims 1 and 13. Applicants note that claims 2 and 11 depend on claim 1 and add separate patentable features to claim 1. Applicants also note that claim 14 depends on claim 13 and adds separate patentable features to claim 13. Applicants submit that McCaughan and ADPA fail to teach or suggest *a semiconductor portion disposed adjacent to the optical waveguide to support the transmission line*, as recited in amended claims 1 and 13. ADPA discloses that TEOS is widely used in industry. ADPA, however, does not teach or suggest *a semiconductor portion disposed adjacent to the optical waveguide to support the transmission line*. Hence, ADPA fails to bridge the factual differences of McCaughan.

In light of the arguments set forth above, McCaughan and ADPA fail to teach or suggest all of the claim limitations of amended claims 1 and 13. Claims 2, 11 and 14, which depend on one of claims 1 and 13, are not rendered obvious over the cited prior art. Applicants therefore request the Examiner to reconsider and withdraw the present rejection under 35 U.S.C. §103(a), and pass the pending claims to allowance.

Rejections of Claims 3-5, 12 and 15-16

Claims 3-5, 12 and 15-16 are rejected under 35 U.S.C. §103(a) as being unpatentable over McCaughan in view of Applicants' Disclosure of Prior Art ("ADPA"). In the aforementioned claim amendments, claim 16 is canceled. Applicants respectfully traverse this rejection in light of the above amendments and the following remarks.

The Examiner indicates that ADPA discloses compound semiconductor for incorporating waveguide structure.

Applicants respectfully submit that McCaughan and ADPA fail to teach or suggest all of the claim limitations of amended claims 1 and 13. Applicants note that claims 3-5 and 12 depend on claim 1 and add separate patentable features to claim 1. Applicants also note that claim 15 depends on claim 13 and adds separate patentable features to claim 13. Applicants submit that McCaughan and ADPA fail to teach or suggest *a semiconductor portion disposed adjacent to the optical waveguide to support the transmission line*, as recited in amended claims 1 and 13. ADPA discloses that integrate circuits use compound semiconductor for incorporating waveguide structure. ADPA, however, does not teach or suggest *a semiconductor portion disposed adjacent to the optical waveguide to support the transmission line*. Hence, ADPA fails to bridge the factual differences of the McCaughan patent.

In light of the arguments set forth above, McCaughan and ADPA fail to teach or suggest all of the claim limitations of amended claims 1 and 13. Claims 3-5, 12 and 15, which depend on one of claims 1 and 13, are not rendered obvious over the cited prior art. Applicants therefore request the Examiner to reconsider and withdraw the present rejection under 35 U.S.C. §103(a), and pass the pending claims to allowance.

New Claims


New claims 21-44 are added to clarify the scope of the claimed invention. Support for the new claims could be found in Figs. 1-4 and corresponding description at pages 7-10. New claims 21-33 depend on amended claim 1 and add separate patentable features to claim 1. For example, claim 21 adds the limitation that one or more air gaps are formed in the circuit recited in claim 1. Based on the claim amendments and arguments set forth above, Applicants submit that new claims 21-33 are patentable and in condition for allowance.

New claims 34-44 depend on amended claim 13 and add separate patentable features to claim 13. For example, claim 44 adds the limitation that one end of the semiconductor portion recited in claim 1 contacts the optical waveguide and an opposed end contacts the planarization layer. Based on the claim amendments and arguments set forth above, Applicants submit that new claims 34-44 are patentable and in condition for allowance.

CONCLUSION

In light of the aforementioned claim amendments and arguments, Applicants contend that each of the Examiners rejections has been adequately addressed and the pending application is in condition for allowance. Should the Examiner feel that a telephone conference with Applicants' attorney would expedite prosecution of this application, the Examiner is urged to contact the Applicants' attorney at (617) 227-7400.

Respectfully submitted,

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